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09/848,896	05/04/2001	Stephen Ernest Jacobson	CH2714 US NA	8728

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EXAMINER

VANOY, TIMOTHY C

ART UNIT PAPER NUMBER

1754

DATE MAILED: 12/13/2002

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Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No. 09-848,896 Applicant(s) JACOBSON et al.  
Examiner VANOY Group Art Unit 1754

PL 3

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE THREE MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

Responsive to communication(s) filed on \_\_\_\_\_  
 This action is FINAL.  
 Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.

### Disposition of Claims

Claim(s) 1 - 10 is/are pending in the application.  
Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 Claim(s) \_\_\_\_\_ is/are allowed.  
 Claim(s) 1 - 10 is/are rejected.  
 Claim(s) \_\_\_\_\_ is/are objected to.  
 Claim(s) \_\_\_\_\_ are subject to restriction or election requirement

### Application Papers

The proposed drawing correction, filed on \_\_\_\_\_ is  approved  disapproved.  
 The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner  
 The specification is objected to by the Examiner.  
 The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. § 119 (a)-(d)

Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).  
 All  Some\*  None of the:  
 Certified copies of the priority documents have been received.  
 Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 Copies of the certified copies of the priority documents have been received  
in this national stage application from the International Bureau (PCT Rule 17.2(a))

\*Certified copies not received: \_\_\_\_\_

### Attachment(s)

Information Disclosure Statement(s), PTO-1449, Paper No(s). 2  
 Notice of Reference(s) Cited, PTO-892  
 Notice of Draftsperson's Patent Drawing Review, PTO-948  
 Interview Summary, PTO-413  
 Notice of Informal Patent Application, PTO-152  
 Other \_\_\_\_\_

## Office Action Summary

## DETAILED ACTION

### *Specification*

*o/L a)* The use of the possible trademark "silicalite" has been noted on pg. 11 ln. 10 in this application. If "silicalite" is a trademark, then it should be capitalized wherever it appears and be accompanied by the generic terminology. **The entire specification should be reviewed to ensure that all trademarks are capitalized.**

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

*o/L a)* Claim 1 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 1 requires the use of a zeolite having a silicon to aluminum ratio ranging from 1 to 4.4 or greater than 5.1. The specification on pg. 7 ln. 14 sets forth that mordenite may be used as the zeolite. U. S. Pat. 5,223,237 in col. 3 Ins. 64-65 reports that the ideal composition for mordenite is  $\text{Na}_2\text{O} \cdot \text{Al}_2\text{O}_3 \cdot 10\text{SiO}_2 \cdot 6\text{H}_2\text{O}$  (i. e. a zeolite having a silicon to aluminum ratio of 5:1). Since mordenite has a

Si:Al ratio of 5:1, then how can it be included as one of the suitable zeolites for the invention, as set forth on pg. 7 ln. 14 in the Applicants' specification?

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicants regard as their invention.

*a*) In claim 1, the phrase "silicon to aluminum ratio in the ranges of from about 1 to about 4.4 or greater than about 5.1" renders the claim language vague and indefinite because it is not clear if a "1:4.4" ratio was intended or if a "1 to 4.4:1" was intended and it is not clear if a "5.1:1" ratio was intended or if a "5:1" was intended.

*b*) In claim 2, if a "provider" sorbs the sulfur trioxide, then "sorbent" of claim 1 does not sorb the sulfur trioxide. If the "user" of claim 2 desorbs the sulfur trioxide, then the "sorbent" of claim 1 did not desorb the sulfur trioxide. Is the "sorbent" really a sorbent, or is it merely a structural support for the "provider" containing sorbed sulfur trioxide that has no capacity to actually sorb sulfur trioxide at all?

*c)* Claim 1 does not particularly point out and distinctly set forth what it is that contains 15 to 100 percent sulfur trioxide. Are the components in the sulfur trioxide feed that are *not* sulfur trioxide the "provider" and "user" of claim 2? Are the Applicants feeding a gas that contains from 15 to 100 percent sulfur trioxide?

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d) None of the claims particularly point out and distinctly set forth what the "provider" and "user" are set forth in claim 2. The Examples in the specification appear to be using only pure zeolite or pure silica.

*AK*

e) Does the sorbent of claim 1 really "consist essentially of" the zeolite of the silica, if it also requires the "provider" and "user" of claim 2?

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

The person having "ordinary skill in the art" has the capability of understanding the scientific and engineering principles applicable to the claimed invention. The references of record in this application reasonably reflect this level of skill.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Pat. 5,223,237 in view of the reference titled "Study of Absorption of sulfur oxides by zeolites" by Anurov et al.

U. S. Pat. 5,223,237 describes at least an obvious variation of the same process for removing sulfur dioxide and/or sulfur trioxide out a gas (please see col. 4 Ins. 30-34), comprising:

passing the sulfur oxides-contaminated gas through a zeolite, which may be chabazite (which has a Si:Al ratio of 2:1) or zeolite X (which has a Si:Al ratio of 2.35:1) so that the sulfur oxides are sorbed into the zeolite (please also see col. 4 Ins. 25-29) at temperatures that are described as being "relatively low" and "on the order of 25 °C (please also see col. 6 Ins. 54-56) and also at (evidently) atmospheric pressure;

purging the sorbed sulfur oxides out of the zeolite by passing a gas at a temperature of about 300 °C through the zeolite so that the gas removes the sulfur oxides out of the zeolite, thereby producing a regenerated zeolite and a sulfur oxides-loaded gas (please also see col. 5 Ins. 26-68), and

repeating the above "passing" and "purging" steps above in a cyclical fashion (please see the operation of the process illustrated in Fig. 1).

Note that the disclosure set forth in col. 3 Ins. 31-32 that zeolites (generally) have pore diameters ranging from 4 to 10 Angstroms, fairly suggests the claimed pore diameter of at least 0.5 nm.

This description of U. S. Pat. 5,223,237 is submitted to render obvious the limitations of at least Applicants' claims 1 and 2, in as much as there is no perceptible distinction between the zeolite and regeneration gases of U. S. Pat. 5,223,237 and the "sorbent", "user" and "provider" of Applicants' claims 1 and 2.

The difference between the Applicants' claims and U. S. Pat. 5,223,237 is that Applicants' claims 1, 3 and 4 require the treatment of a gas containing from 15 to 100% sulfur trioxide, and Applicants' claim 5 requires that the amount of sulfur trioxide sorbed on the sorbent ranges from 3 to 60 weight percent (whereas the process of U. S. Pat. 5,223,237 typically treats a flue gas: please see col. 9 ln. 50, and please note that Example 1 describes a sulfur dioxide concentration of 2000 ppm) - additionally, Applicants' claim 1 sets forth that the contacting is conducted under anhydrous conditions (whereas the process of U. S. Pat. 5,223,237 appears to treat a water-containing gas in as much as flue gases may typically contain some water - especially if they are emitted from a combustor).

The disclosure set forth in col. 3 Ins. 56-62 and col. 4 Ins. 25-34 in U. S. Pat. 5,223,237 that a variety of zeolites, to include the chabazite and zeolite X embraced in the scope of the Applicants' claims, can sorb "sulfur oxides gases" (which is defined to

include sulfur dioxide and sulfur trioxide) fairly suggests to one skilled in the art that the claimed zeolites can sorb sulfur trioxide at any concentration in the gas (to include the 15 to 100% reported in Applicants' claim 1). Additionally, the disclosure set forth in col. 4 Ins. 15-16 that all zeolites preferably sorb water over sulfur oxide gas fairly suggests to one skill in the art that the sulfur trioxide-containing feed gas should be free from water because it competes with the sulfur trioxide as a component to be sorbed into the zeolite.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the process described in U. S. Pat. 5,223,237 to treat anhydrous gas containing from 15 to 100 percent sulfur trioxide, in the manner required by at least Applicants' claim 1, because the disclosures set forth in col. 3 Ins. 56-62 and col. 4 Ins. 25-34 fairly suggest this utility for their zeolites, consistent with the discussion of the *Sinclair & Carroll Co. vs. Interchemical Corp.* 325 U. S. 327, 65 USPQ 297 court decision set forth in section 2144.07 in the MPEP (8<sup>th</sup> ed.) where it was determined that the selection of a known material based on its suitability for it's intended use supported a *prima facie* obviousness determination.

Additionally, note that it is fully expected that the zeolite resulting from the treatment of a gas containing from 15 to 100% sulfur trioxide will inherently have from 3 to 60 percent by weight of sulfur trioxide loaded on it as set forth in Applicants' claim 5 and at least 1% by weight of sulfur trioxide loaded on it as set forth in Applicants' claim 8.

The difference between the Applicants' claims and U. S. Pat. 5,223,237 is that Applicants' claim 1 sets forth that sorption temperatures range from 35 to 150 °C and Applicants' claim 6 sets forth that the sorption temperatures range from 50 to 125 °C.

The paragraph bridging pages 2 and 3 and the paragraph bridging pages 3 and 4 in the Anurov reference fairly teaches that zeolites can sorb sulfur trioxide out of a gas at temperatures ranging from 20 to 150 °C.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to *further describe* the temperature at which the zeolites of U. S. Pat. 5,223,237 can sorb sulfur trioxide out of a gas as ranging from 35 to 150 oC, as set forth in at least Applicants' claims 1 and 8, because the disclosure set forth on pgs. 2-4 in the Anurov reference fairly teaches and suggests that zeolites can sorb sulfur trioxide out of a gas at these claimed temperatures: please see discussion of the court decisions set forth in section 2144.05(I) in the MPEP (8<sup>th</sup> ed.).

The difference between the Applicants' claims and U. S. Pat. 5,223,237 is that Applicants' claims 7 and 9 set forth that the zeolite used has a Si:Al ratio of at least 25, whereas the claims set forth in U. S. Pat. 5,223,237 call for the use of zeolites generically to sorb the sulfur trioxide.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to *preferentially use* the particular species of zeolites having Si:Al ratio of at least 25 as the broad and generic "zeolite" recited in the claims of U. S. Pat. 5,223,237 in the process of sulfur trioxide sorption obvious from U. S. Pat. 5,223,237, in the manner set forth in the Applicants' claims, because the courts have already

determined that a claim drawn to a specific compound is anticipated by a prior art reference teaching a generic formula embracing a limited number of compounds closely related to each other in structure and properties: please see the discussion of the *In re Schauman* 572 F.2d 312, 197 USPQ 5 (CCPA 1978) court decision set forth in section 2131.02 in the MPEP (8<sup>th</sup> ed.) for further details.

Note that no distinction is seen or has been shown (or is expected) between the physical form of the zeolites of U. S. Pat. 5,223,237 and the physical form of the zeolite described in Applicants' claim 10.

U. S. Pat. 5,447,701 disclosing a method for the purification of a gas by using a silicalite sorbent is made of record.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy C. Vanoy whose telephone number is 703-308-2540. The examiner can normally be reached on 8 hr. days.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman, can be reached on 703-308-3837. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Timothy Vanoy/tv  
December 11, 2002

*Timothy Vanoy*  
Timothy Vanoy  
Patent Examiner  
Art Unit 1754